
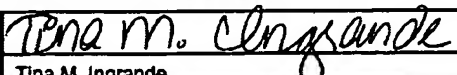


<b>OPTIONAL TRANSMITTAL FORM</b> JUL 20 2005 (to be used for all correspondence after initial filing)	Application Number	10/656,063
	Filing Date	September 5, 2003
	First Named Inventor	Hassan MOSTAFAVI
	Art Unit	2882
	Examiner Name	Hoon K. Song
Total Number of Pages in This Submission	Attorney Docket Number	VM7031422003

ENCLOSURES (check all that apply)		
<input checked="" type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input checked="" type="checkbox"/> Amendment / Reply <input checked="" type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Reply to Missing Parts/ Incomplete Application <input type="checkbox"/> Reply to Missing Parts under 37 CFR1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) ____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): 1. Return Receipt Postcard 2. Copy of form PTO/SB/08b submitted on March 22, 2005 (1 pg.)
<b>Remarks</b>  		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT			
Firm	Bingham McCutchen LLP		
Signature			
Printed Name	Gerald Chan		
Date	July 18, 2005	Reg. No.	51,541

CERTIFICATE OF TRANSMISSION/MAILING			
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.			
Signature			
Typed or printed name	Tina M. Ingrande	Date	July 18, 2005

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Effective on 12/08/2004.  
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

# FEE TRANSMITTAL

JUL 20 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 300

## Complete If Known

Application Number 10/656,063  
Filing Date September 5, 2003  
First Named Inventor Hassan MOSTAFAVI  
Examiner Name Hoon K. Song  
Art Unit 2882  
Attorney Docket No. VM7031422003

## METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify) : \_\_\_\_\_  
☒ Deposit Account Deposit Account Number: 50-2518 Deposit Account Name: Bingham McCutchen LLP

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee  
☒ Charge any additional fee(s) or underpayments of fee(s) ☒ Credit any overpayments  
Under 37 CFR 1.16 and 1.17

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## FEE CALCULATION

### 1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	_____
Design	200	100	100	50	130	65	_____
Plant	200	100	300	150	160	80	_____
Reissue	300	150	500	250	600	300	_____
Provisional	200	100	0	0	0	0	_____

### 2. EXCESS CLAIM FEES

Fee Description	Small Entity Fee (\$)	Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 30 (including Reissues)	200	100
Multiple dependent claims	360	180
<b>Total Claims</b>	<b>Extra Claims</b>	<b>Fee (\$)</b>
53	-47 (HP) = 6	x 50 = 300
HP = highest number of total claims paid for, if greater than 20.		
<b>Indep. Claims</b>	<b>Extra Claims</b>	<b>Fee (\$)</b>
9	-9 (HP) = 0	x 200 = 0
HP = highest number of independent claims paid for, if greater than 3.		

### 3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).


Total Sheets Extra Sheets Number of each additional 50 or fraction thereof Fee (\$)

\_\_\_\_\_ - 100 = \_\_\_\_\_ / 50 = \_\_\_\_\_ (round up to a whole number) x \_\_\_\_\_ = \_\_\_\_\_

### 4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)  
Other (e.g., late filing surcharge): \_\_\_\_\_

## SUBMITTED BY

Signature  Registration No. 51,541 Telephone (650) 849-4960  
Name (Print/Type) Gerald Chan Date July 18, 2005

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PATENT  
Attorney Docket No. VM7031422003  
Varian No. 03-010US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Hassan MOSTAFAVI

Serial No.: 10/656,063

Filed: September 5, 2003

For: SYSTEMS AND METHODS FOR  
PROCESSING X-RAY IMAGES

) Group Art Unit: 2882

) Examiner: Song, Hoon K.

AMENDMENT AFTER FINAL

**MAIL STOP AF**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

In response to the Final Office Action mailed on May 18, 2005, kindly amend the application in accordance with the following amendment sheet(s).

Amendments to the Claims begin on page 2.

Remarks begin on page 10.

07/21/2005 MWOLDGE1 00000028 502518 10656063

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**AMENDMENTS TO THE CLAIMS**

Please amend claims 1, 8, 11, 18, 25, 28, 35, 40, and 43, and insert new claims 48-53. A complete listing of the current pending claims is provided below and supersedes all previous claim lists.

1. (Currently Amended) A method of processing a x-ray image, comprising:  
collecting a first x-ray image and a second x-ray image;  
determining a composite image based on the first and second x-ray images;  
collecting a third x-ray image, wherein at least a portion of the first x-ray image and at least a portion of the third x-ray images comprise images of a same portion of an object; and  
enhancing a feature in the third x-ray image by adjusting the third x-ray image based on the composite image.
2. (Original) The method of claim 1, wherein the first, second, and third x-ray images are generated in a sequence.
3. (Original) The method of claim 1, wherein the first, second, and third x-ray images each contains an image of at least a portion of an animal body.
4. (Original) The method of claim 1, wherein the determining a composite image comprises performing an image averaging on the first and second x-ray images.
5. (Original) The method of claim 4, wherein the image averaging is performed using a boxcar averaging technique.
6. (Original) The method of claim 4, wherein the image averaging is performed based on a weighted average.

7. (Original) The method of claim 1, wherein the adjusting comprises subtracting the composite image from the third x-ray image.
8. (Currently Amended) A system for processing a x-ray image, comprising:  
means for collecting a first x-ray image and a second x-ray image;  
means for determining a composite image based on the first and second x-ray images;  
means for collecting a third x-ray image, wherein at least a portion of the first x-ray image  
and at least a portion of the third x-ray images image comprise images of a same portion of an  
object; and  
means for enhancing a feature in the third x-ray image by adjusting the third x-ray image  
based on the composite image.
9. (Original) The system of claim 8, wherein the means for determining a composite image  
comprises means for performing an image averaging on the first and second x-ray images.
10. (Original) The system of claim 8, wherein the means for adjusting comprises means for  
subtracting the composite image from the third x-ray image.
11. (Currently Amended) A computer readable medium having a set of stored instructions, the  
execution of which causes a process to be performed, the process comprising:  
collecting a first x-ray image and a second x-ray image;  
determining a composite image based on the first and second x-ray images;  
collecting a third x-ray image, wherein at least a portion of the first x-ray image and at least a  
portion of the third x-ray images image comprise images of a same portion of an object; and  
enhancing a feature in the third x-ray image by adjusting the third x-ray image based on the  
composite image.
12. (Original) The computer readable medium of claim 11, wherein the first, second, and third x-  
ray images are generated in a sequence.

13. (Original) The computer readable medium of claim 11, wherein the first, second, and third x-ray images each contains an image of at least a portion of an animal body.

14. (Original) The computer readable medium of claim 11, wherein the determining a composite image comprises performing an image averaging on the first and second x-ray images.

15. (Original) The computer readable medium of claim 14, wherein the image averaging is performed using a boxcar averaging technique.

16. (Original) The computer readable medium of claim 14, wherein the image averaging is performed based on a weighted average.

17. (Original) The computer readable medium of claim 11, wherein the adjusting comprises subtracting the composite image from the third x-ray image.

18. (Currently Amended) A method of processing a x-ray image, comprising:  
collecting one or more x-ray images;  
determining a composite image based on the one or more x-ray images;  
collecting an input x-ray image, wherein at least a portion of one of the one or more x-ray images and at least a portion of the input x-ray image comprise images of a same portion of an object; and  
enhancing a feature of the input x-ray image based on the composite image.

19. (Original) The method of claim 18, wherein the collecting the one or more x-ray images comprises generating the one or more x-ray images in a sequence.

20. (Original) The method of claim 18, wherein the input x-ray image contains an image of at least a portion of an animal body.

21. (Original) The method of claim 18, wherein the determining a composite image comprises performing an image averaging on the one or more x-ray images.
22. (Original) The method of claim 21, wherein the image averaging is performed using a boxcar averaging technique.
23. (Original) The method of claim 21, wherein the image averaging is performed based on a weighted average.
24. (Original) The method of claim 18, wherein the enhancing comprises subtracting the composite image from the input x-ray image.
25. (Currently Amended) A system for processing an image, comprising:  
means for collecting one or more x-ray images;  
means for determining a composite image based on the one or more x-ray images;  
means for collecting an input x-ray image, wherein at least a portion of one of the one or more x-ray images and at least a portion of the input x-ray image comprise images of a same portion of an object; and  
means for enhancing a feature of the input x-ray image based on the composite image.
26. (Original) The system of claim 25, wherein the means for determining a composite image comprises means for performing an image averaging on the one or more x-ray images.
27. (Original) The system of claim 25, wherein the means for enhancing comprises means for subtracting the composite image from the input x-ray image.
28. (Currently Amended) A computer readable medium having a set of stored instructions, the execution of which causes a process to be performed, the process comprising:  
collecting one or more x-ray images;

determining a composite image based on the one or more x-ray images;

collecting an input x-ray image, wherein at least a portion of one of the one or more x-ray images and at least a portion of the input x-ray image comprise images of a same portion of an object; and

enhancing a feature of the input x-ray image based on the composite image.

29. (Original) The computer readable medium of claim 28, wherein the collecting the one or more images comprises generating the one or more x-ray images in a sequence.

30. (Original) The computer readable medium of claim 28, wherein the input x-ray image contains an image of at least a portion of an animal body.

31. (Original) The computer readable medium of claim 28, wherein the determining a composite image comprises performing an image averaging on the one or more x-ray images.

32. (Original) The computer readable medium of claim 31, wherein the image averaging is performed using a boxcar averaging technique.

33. (Original) The computer readable medium of claim 31, wherein the image averaging is performed based on a weighted average.

34. (Original) The computer readable medium of claim 28, wherein the enhancing comprises subtracting the composite image from the input x-ray image.

35. (Currently Amended) A method of processing a x-ray image, comprising:

obtaining a first x-ray image;

obtaining a second x-ray image, wherein the first and the second x-ray images are obtained using x-ray having an energy level, and at least a portion of the first x-ray image and at least a portion of the second x-ray image comprise images of a same portion of an object; and



determining a composite image based on at least a portion of the first and second x-ray images.

36. (Original) The method of claim 35, wherein the first and second x-ray images are generated in a sequence.

37. (Original) The method of claim 35, wherein the first and second x-ray images each contains an image of at least a portion of an animal body.

38. (Original) The method of claim 35, wherein the determining a composite image comprises subtracting at least a portion of the first x-ray image from at least a portion of the second x-ray image.

39. (Original) The method of claim 35, further comprising determining a value associated with a contrast of the composite image.

40. (Currently Amended) A system for processing a x-ray image, comprising:  
means for obtaining a first x-ray image;  
means for obtaining a second x-ray image, wherein the first and the second x-ray images are obtained using x-ray having an energy level, and at least a portion of the first x-ray image and at least a portion of the second x-ray image comprise images of a same portion of an object; and  
means for determining a composite image based on at least a portion of the first x-ray image and at least a portion of the second x-ray image.

41. (Original) The system of claim 40, wherein the means for determining a composite image comprises means for subtracting at least a portion of the first x-ray image from at least a portion of the second x-ray image.

42. (Original) The system of claim 40, further comprising means for determining a value associated with a contrast of the composite image.
43. (Currently Amended) A computer readable medium having a set of stored instructions, the execution of which causes a process to be performed, the process comprising:  
obtaining a first x-ray image;  
obtaining a second x-ray image, wherein the first and the second x-ray images are obtained using x-ray having an energy level, and at least a portion of the first x-ray image and at least a portion of the second x-ray image comprise images of a same portion of an object; and  
determining a composite image based on at least a portion of the first and second x-ray images.
44. (Original) The computer readable medium of claim 43, wherein the first and second x-ray images are generated in a sequence.
45. (Original) The computer readable medium of claim 43, wherein the first and second x-ray images each contains an image of at least a portion of an animal body.
46. (Original) The computer readable medium of claim 43, wherein the determining a composite image comprises subtracting at least a portion of the first x-ray image from at least a portion of the second x-ray image.
47. (Original) The computer readable medium of claim 43, wherein the process further comprising determining a value associated with a contrast of the composite image.
48. (New) The method of claim 1, wherein the feature comprises a moving feature.
49. (New) The system of claim 8, wherein the feature comprises a moving feature.

50. (New) The computer readable medium of claim 11, wherein the feature comprises a moving feature.

51. (New) The method of claim 35, wherein the first and the second x-ray images are generated using an imaging device that remains stationary between a first time at which the first x-ray image is generated and a second time at which the second x-ray image is generated.

52. (New) The system of claim 40, wherein the means for obtaining the first x-ray image and the means for obtaining the second x-ray image comprises an imaging device that remains stationary between a first time at which the first x-ray image is generated and a second time at which the second x-ray image is generated.

53. (New) The computer readable medium of claim 43, wherein the first and the second x-ray images are generated using an imaging device that remains stationary between a first time at which the first x-ray image is generated and a second time at which the second x-ray image is generated.

## **REMARKS**

Amendments to claims 1, 8, 11, 18, 25, 28, 35, 40, and 43 are for the purpose of clarifying what Applicant regards as the invention. No new matter has been added.

### **I. CLAIM REJECTIONS UNDER 35 U.S.C. § 112**

Claims 38, 41, and 46 stand rejected under 35 U.S.C. § 112 as allegedly being indefinite. According to the Office Action, it is unclear how to generate a composite image by subtracting one image from another. Applicant respectfully directs the Examiner's attention to paragraphs 76, which describes in one embodiment that a composite image is generated as a result of subtracting one image from another.

### **II. CLAIM REJECTIONS UNDER 35 U.S.C. § 102**

Claims 1-4, 6-14, 16-21, 23-31, and 33-34 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,434,215 (Cesmeli). Claims 35-41 and 43-47 stand rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,678,399 (Doi). Applicant respectfully notes that in order to sustain a rejection under §102, each element in the rejected claim must be found, either expressly or inherently, in the cited reference.

#### **Claims 1, 8, 11, 18, 25, and 28**

Claims 1, 8, and 11 each recites *enhancing a feature* in a x-ray image (emphasis added). Claims 18, 25, and 28 each recites a similar limitation. Cesmeli does not disclose or suggest such limitation. Rather, Cesmeli discloses determining a region of interest by subtracting an average set of views from a view set (column 5, lines 8-30). As such, Cesmeli does not disclose or suggest enhancing a feature in an image, as recited in each of claims 1, 8, 11, 18, 25, and 28. For at least the foregoing reason, claims 1, 8, 11, 18, 25, and 28, and their respective dependent claims, are believed allowable over Cesmeli.

Claims 35, 40, and 43

Claims 35, 40, and 43 each recites obtaining a first x-ray image and a second x-ray image, wherein at least a portion of the first x-ray image and at least a portion of the second x-ray image comprise images of a same portion of an object. Doi does not disclose or suggest such limitation. Rather, Doi discloses obtaining a plurality of section images at *different cross sectional planes* of an object (see figures 1 and 7a-7c). As such, Doi discloses obtaining section images of *different portions* of an object. For at least the foregoing reason, claims 35, 40, and 43, and their respective dependent claims, are believed allowable over Doi.

III. INFORMATION DISCLOSURE STATEMENT

Applicant submitted an Information Disclosure Statement on March 22, 2005. However, we have not yet received confirmation that reference number 1 listed on form PTO/SB/08b has been initialed and considered. Attached hereto is a copy of the form PTO/SB/08b (1 pg.). Applicant hereby respectfully requests that the reference listed on form PTO/SB/08b be initialed and considered by the Examiner.


**CONCLUSION**

Based on the foregoing, all remaining claims are believed in condition for allowance. If the Examiner has any questions or comments regarding this amendment, please contact the undersigned at the number listed below.

The Commissioner is authorized to charge any fees due in connection with the filing of this document to Bingham McCutchen's Deposit Account No. 50-2518, referencing billing number 7031422003. The Commissioner is authorized to credit any overpayment or to charge any underpayment to Bingham McCutchen's Deposit Account No. 50-2518, referencing billing number 7031422003.

Respectfully submitted,  
Bingham McCutchen LLP

Dated: July 18, 2005

By:   
Gerald Chan  
Reg. No. 51,541

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Sheet	1	of	2
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<b>Application Number</b>	<b>10/656,063</b>
<b>Filing Date</b>	<b>September 5, 2003</b>
<b>First Named Inventor</b>	<b>Hassan MOSTAFAVI</b>
<b>Art Unit</b>	<b>2882</b>
<b>Examiner Name</b>	<b>Hoon K. Song</b>
<b>Attorney Docket Number</b>	<b>VM7031422003</b>

[illegible]

**Examiner's  
Signature**

Date  
Considered

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